

**TWO NEW SPECIES OF *MEGASELIA* RONDANI (DIPTERA: PHORIDAE)
FROM COSTA RICA**

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Abstract.—Two new species, *Megaselia prolixfurca* and *M. tauypalpis*, are described from mid- to high elevations in Costa Rica.

Key Words: Diptera, Phoridae, *Megaselia*, Neotropical, Costa Rica, taxonomy

The Phoridae is a large group of poorly-known flies, found worldwide in nearly all terrestrial habitats. Larvae have a tremendous range of food sources, with various species being scavengers, predators, herbivores, parasitoids, or true parasites (summarized by Disney 1994), although the life-style of the great majority of species is unknown. There are approximately 3,400 described species of phorids, but this is generally considered to be as little as one-tenth of the actual diversity of the family, with estimates of the total ranging from 20,000–50,000 species (Disney 1983, Gaston 1991).

The giant genus *Megaselia* Rondani includes at present 1,452 species and accounts for about one-half of the described species of Phoridae. Of these, only about 340 species are described from the Neotropical Region, the area of probable greatest species richness for these flies. In comparison, the better studied, but presumably less diverse Palearctic Region has 420 described *Megaselia*, which is still of course a great underestimation of the true fauna. All regions of the world are poorly-known, as clearly demonstrated for the Australasian Region by Disney (2003) and the majority of species remain undescribed. The dauntingly large number of (mostly undescribed)

species, small size, and apparent uniformity of these flies has contributed to a situation where *Megaselia* are essentially unidentifiable, outside of England, for which a good handbook to the species exists (Disney 1989), and nearby parts of Europe.

The most recent keys to Neotropical species of *Megaselia* are those of Borgmeier (1962, 1969, 1971), but they are virtually worthless for identifying most specimens. A new synthesis of the Neotropical *Megaselia* is required, although this would be a huge task that would be the work of a lifetime. Consequently, we herein describe two distinctive new species of *Megaselia* that are reasonably common at middle and high elevations in Costa Rica, and that might be noticed by a general collector.

MATERIALS AND METHODS

Specimens belong to the following institutions (codens from Arnett et al. 1993):

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| CMNH | Carnegie Museum of Natural History, Pittsburgh, PA, USA. |
| INBC | Instituto Nacional de Biodiversidad, Santo Domingo, Heredia, Costa Rica. |
| LACM | Natural History Museum of Los Angeles County, Los Angeles, CA, USA. |

- MCZC Museum of Comparative Zoology, Cambridge, MA, USA.
 MUCR Universidad de Costa Rica, San José, Costa Rica.
 USNM National Museum of Natural History, Smithsonian Institution, Washington DC, USA.

Barcoded labels are placed on the pin of each specimen. Those of holotypes are given in square brackets.

Costal sector ratios are the distance between the humeral crossvein and R_1 (= sector 1): distance between R_1 and R_{2+3} (= sector 2): distance between R_{2+3} and R_{4+5} (= sector 3). All costal sector measurements are divided by the value of sector 3.

TAXONOMY

Megaselia prolixifurca Kung and Brown, new species

(Figs. 1–3)

Diagnosis.—The unusually long wing vein fork (composed of R_{2+3} and R_{4+5}) easily distinguishes this species from all other described Neotropical *Megaselia*.

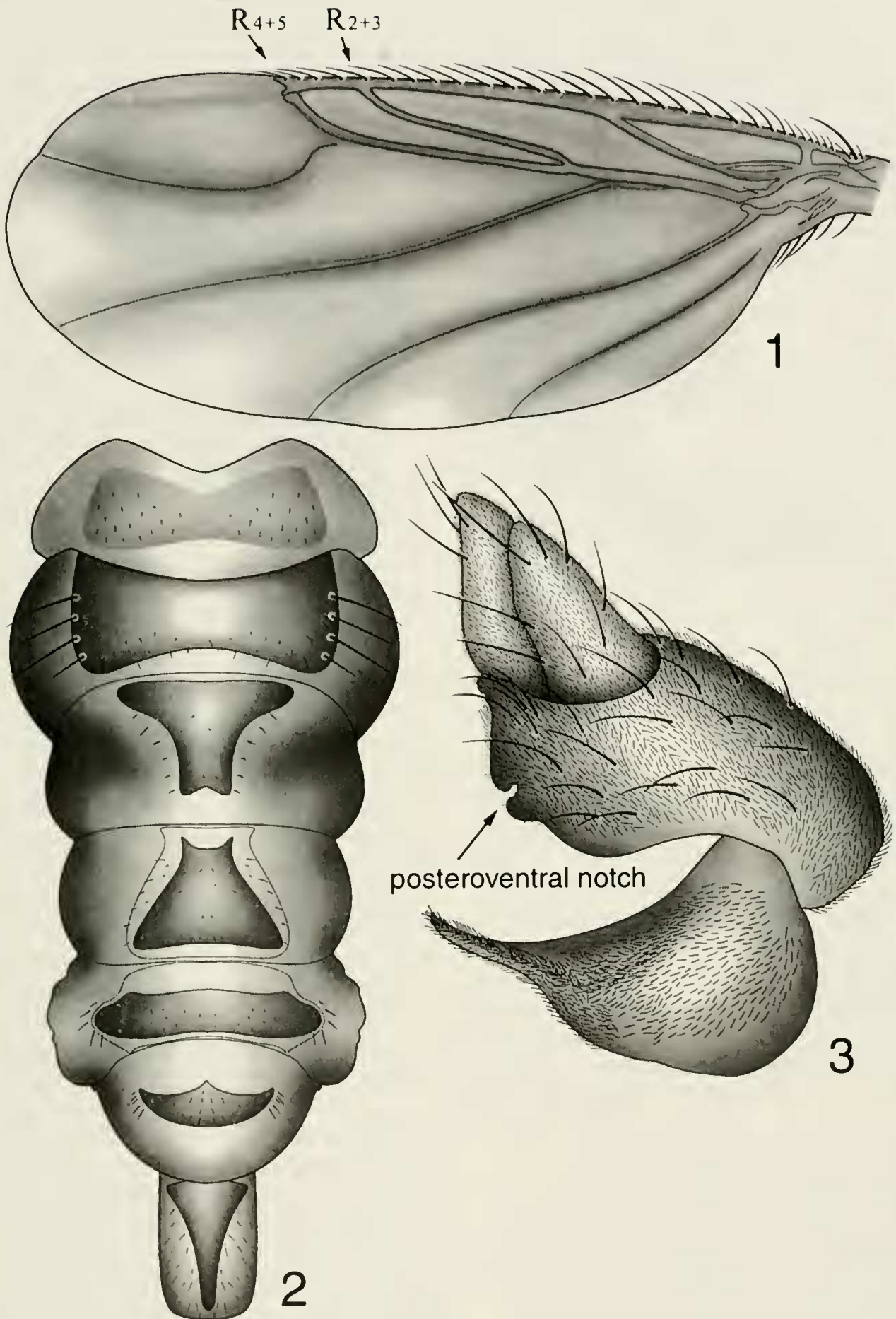
Description.—Body length 2.0 to 3.2 mm. Frons dark brown, broader than high. Ventral interfrontal seta about halfway between ventral fronto-orbital and dorsal supra-antennal setae. Two pairs of supra-antennal setae present, ventral pair approximately three-fifths length and slightly thinner than dorsal pair. Flagellomere 1 brown, round. Palpus yellowish brown with long, thick setae, apical setae nearly as long as palpus. Scutum and scutellum both yellowish brown. Anterior scutellar seta one-tenth length and thickness of posterior, similar in length and thickness to setae on scutum. Pleuron mostly yellowish brown, except for anepimeron which is almost entirely dark brown. Proepisternum bordered from dorsal margin posteriorly to ventral margin with sparse, long setae. Setae at dorsal margin and ventral margin at least twice as thick as setae along posterior margin; ventral setae much longer than dorsal setae. Anepisternum bare. Legs uniformly light brown. Mid- and hind tibiae

both with anterodorsal, longitudinal setal palisade, although setal palisade only extends about halfway on midtibia. Mid- and hind tibiae both with posterodorsal row of widely spaced, thicker setae. Wing (Fig. 1) 2.4 to 3.5 mm. Costa 0.61 to 0.68 wing length. Mean costal sector ratio 2.8:3.3:1; range 2.1–3.4; 2.1–4.1:1. Costal setae 0.15 to 0.22 mm. Vein R_{2+3} present; fork greatly elongate, originating from only slightly posterior to apex of R_1 to originating from midway between R_1 and R_{2+3} . Wing membrane darkened along thin veins, two specimens with darkened membrane also along wing margin. Halter yellow to light brown.

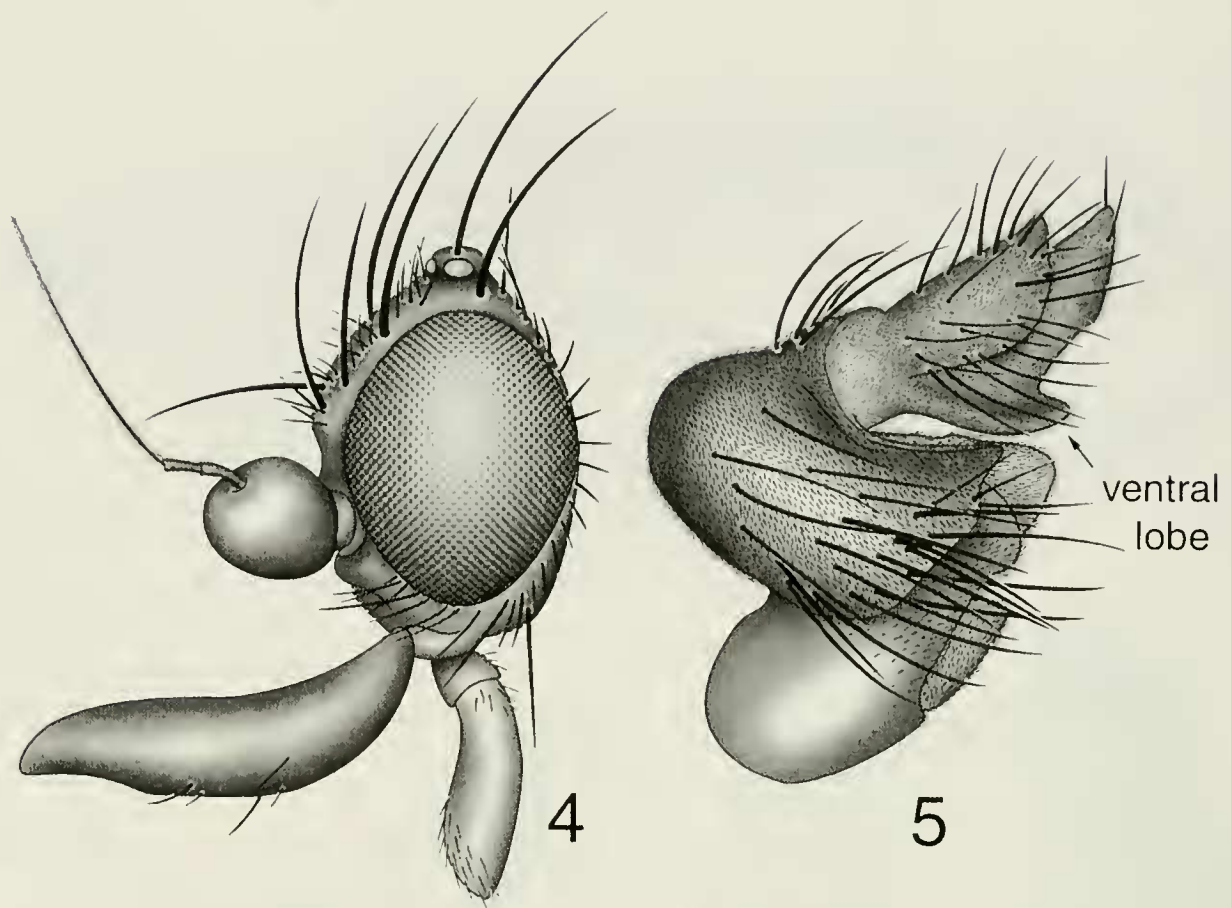
Female abdomen: Tergites (Fig. 2) with sparse, short, thin setae; yellow, except one specimen from Villa Mills dark brown. Tergite 1 lighter in color than other tergites; rectangular, anteromedially and posteromedially shortened. Tergite 2 rectangular, almost width of abdomen, with long, thick lateral setae. Tergite 3 triangular, narrowed posteriorly with truncate posterior apex. Tergite 4 similar in shape to tergite 3, except broader and narrowed anteriorly instead of posteriorly. Tergites 3 and 4 form hourglass-shape. Abdominal segment 5 laterally with eversible glands; tergite short, linear, rounded laterally. Tergite 6 crescent shaped. Tergite 7 elongate, triangular, narrowed posteriorly. Sternite 7 narrow, elongate, slightly thickened posteriorly. Tergite 8 rectangular with anterior notch. Apex of segment 8 ventrally without large sclerites, with denser posterolateral setae.

Male abdomen: Tergites brown to dark brown, not reduced, with sparse, thin setae. Terminalia (Fig. 3) with scattered, thin setae. Right side of epandrium with posteroventral notch. Process on left hypandrial lobe large and broad; process on right hypandrial lobe smaller, about one-half length and width of left.

Type material.—Holotype ♂: COSTA RICA: San José: 20 km S Empalme, 9.63°N, 83.85°W, iv.1989, P. Hanson, Malaise trap, 2800 m [LACM ENT 063327] (LACM). Paratypes: COSTA



Figs. 1–3. *Megaselia prolixifurca*. 1, Wing. 2, Female abdomen, dorsal view. 3, Male terminalia, right lateral view.



Figs. 4–5. *Megaselia tanypalpis*. 4, Head, lateral view. 5, Male terminalia, left lateral view.

RICA: Cartago: 4 km NE Cañon, Genesis II, 9.71°N, 83.91°W, 1 ♀, viii.1995, P. Hanson, Malaise trap, 2350 m; San José: 16 km S [corrected to 19 km S, 3 km W] Empalme, 9.65°N, 83.87°W, 3 ♀, iii–iv.1989, P. Hanson, I. Gauld, Malaise trap, 2600 m; 20 km S Empalme, 9.63°N, 83.85°W, 1 ♀, viii.1988, 4 ♀, ix.1988, 1 ♀, x.1988, 2 ♂, 2 ♀, iv.1989, 1 ♂, iii–vi.1990, P. Hanson, Malaise trap, 2800 m; Estación Biológica Cuerici, 9.55°N, 83.67°W, 1 ♀, i.2000, P. Hanson, Malaise trap, 2600 m; Villa Mills, Cerro de la Muerte, 9.57°N, 83.73°W, 1 ♂, 1 ♀, iii–iv.1989, P. Hanson, Malaise trap, 3000m (CMNH, INBC, LACM, MCZC, MUCR, USNM).

Etymology.—The name is a combination of the Latin words *prolixus*, meaning stretched out in length, and *furca*, fork, referring to the elongate fork in the wing.

***Megaselia tanypalpis* Kung and Brown,
new species**

(Figs. 4–5)

Diagnosis.—This species is most easily recognized by its elongate palpus, and the

long, dense setae on the epandrium. *Megaselia tanypalpis* is also distinguished by its single pair of supra-antennal setae and the presence of one long seta in addition to short, thin setae on the anepisternum.

Megaselia tanypalpis can be considered as having two or four scutellar setae in Borgmeier's terminology, so we attempted to key out this species both directions. *Megaselia tanypalpis* keys to *M. rhabdopalpis* Borgmeier in Borgmeier's 1962 key to Neotropical *Megaselia* when treated as having 4 scutellar bristles. It differs from *M. rhabdopalpis* in its larger size and more elongate palpus; *M. rhabdopalpis* has a broader, shorter, more cylindrical palpus. This species also differs from *M. rhabdopalpis* by the presence of long, dense setae on the genitalia, and a stalked proctiger. When the scutellum is considered to have 2 bristles in the same key, *M. tanypalpis* keys to *M. seticlasper* Borgmeier, but the setae on the epandrium are much denser in *M. tanypalpis* than in this species. In Borgmeier (1969), *M. tanypalpis* keys to couplet

6 when "scutellum with 4 bristles" is used (in couplet 2), but does not fit either species. *Megaselia tanypalpis* keys to *M. subinflata* Borgmeier in couplet 7 when "scutellum with 2 bristles" is used, but differs from *M. subinflata* by a much longer costal ratio and enlarged palpus. *Megaselia tanypalpis* keys to *M. spinipectus* Borgmeier in Borgmeier's 1971 key when "scutellum with 4 bristles" is used (in couplet 2), but is easily differentiated by its elongate palpus. When keyed using "scutellum with 2 bristles," *M. tanypalpis* keys to the female of *M. laevigata* Borgmeier, but does not resemble the description.

Description.—Body length 2.0 to 2.8 mm. Frons dark brown, approximately twice as broad as high. Ventral interfrontal seta approximately halfway between ventral fronto-orbital and supra-antennal setae, slightly closer to eye margin than midline. One pair of supra-antennal setae present, slightly thinner and shorter than ventral interfrontal seta. Flagellomere 1 and palpus light brown. Flagellomere 1 round. Palpus (Fig. 4) greatly enlarged, one and one-half to almost twice length of head, inflated, with sparse, thin setae. Scutum brown, scutellum darker. Anterior scutellar seta approximately one-third to one-half length and one-third thickness of posterior. Pleuron mostly light brown to brown; proepisternum, anepisternum, and anepimeron always darker. In some specimens pleuron also darkened ventrally. Proepisternum ventrally with one long seta and few shorter setae; dorsally with sparse thin setae, or bare. Anepisternum with short, thin setae and one long, thick seta. Legs uniformly light brown. Mid tibia and hind tibia both with anterodorsal, longitudinal setal palisade, plus posterodorsal row of widely spaced, thicker setae. Wing 2.4 to 3.0 mm. Costa 0.60 to 0.64 wing length. Mean costal sector ratio 2.4:1.6:1; range 1.7–3.2:1.1–2.0:1. Costal setae 0.08 to 0.12 mm. Vein R_{2+3} present. Halter dark brown.

Male abdomen: Abdominal tergites dark brown, matte. Venter of abdominal seg-

ments 3–6 with with long, thickened setae; on each segment the setae being slightly longer posteriorly. Posterior row of setae on venter of abdominal segment 6 dorsally pointed, about one and one-half to two times longer and thicker than those of other segments. Both sides of epandrium (Fig. 5) with long, thick, dense setae. Hypandrium without large projections. Proctiger stalked, with ventral lobe.

Female: Unknown.

Type material.—Holotype ♂: COSTA RICA: San José: Zurquí de Moravia, 10.05°N, 84.02°W, iv.1989, P. Hanson, Malaise trap, 1600 m [LACM ENT 062307] (LACM). Paratypes: COSTA RICA: San José: Braulio Carillo National Park, 10.12°N, 83.97°W, 1 ♂, iv–v.1990, P. Hanson, Malaise trap, 1000 m; Zurquí de Moravia, 10.05°N, 84.02°W, 2 ♂, 2–8.iii.1995, B. Brown, Malaise trap, 1600 m; 1 ♂, iii.1989, 8 ♂, iv.1989, 4 ♂, v.1989, 1 ♂, vi.1995, 1 ♂, i.1996, 1 ♂, vi.1996, P. Hanson, Malaise trap, 1600 m (INBC, LACM, MCZC, MUCR, USNM).

Etymology.—The name is from the Greek word for long and outstretched, referring to the long palpus of the species.

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